

Town of Arlington

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January 24, 2017
Joellyn Brazile, CPESC
TDEC Division of Water Resources
Memphis Environmental Field Office
8383 Wolf Lake Drive
Bartlett, TN 38133

RE: Progress Report regarding PAI
Town of Arlington Wastewater Treatment Plant
NPDES Permit no. TN0078603
Shelby County

Dear Ms. Brazile,

Please accept this letter and enclosed documents in response to the NOV issued to the Town of Arlington Sewage Treatment Plant (STP) on January 17, 2017. Many of the deficiencies noted during the Performance Audit Inspection (PAI) were corrected immediately. Plans were set into motion to correct those which required more time. The corrective actions taken at that time were outlined in my response letter to Mr. Eddy Bouzeid on November 22, 2016 (see attachment A). Since that time, we have been diligently working to improve not only in those areas where we were deficient but in all areas of the wastewater program. Delineated in part A are the findings of the PAI with a description of the corrective actions taken. Part B will address actions taken or to be taken to eliminate future exceedances.

Part A

1. The sample jugs in the influent and effluent composite samplers were not cleaned after each 24-hr composite sampling event. The potential for sample cross-contamination is a big concern. The jugs need to be cleaned or exchanged with clean ones after each 24-hr sampling event to ensure representative sampling as required by the permit.

Both the influent and effluent composite sample jugs are exchanged daily with clean jugs. A Standard Operating Procedure (SOP) has been developed and implemented for cleaning the sample jugs using a phosphate free detergent designed for cleaning environmental sampling equipment.

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2. The influent and effluent sampler intake tubing placement was incorrect. They were placed near the side walls of the influent and effluent structures. The intake tubing needs to be near the center of the partial flume to ensure representative samples.

Both the influent and effluent composite sampler intake tubes have been repositioned as recommended by Ms. Loudermilk and Mr. Bouzeid.

3. The dissolved oxygen (DO) was not collected as required by approved methodology. Samples were being brought to the plant laboratory for DO and PH measurements. More accurate measurements should be taken at the point where samples are collected on-site.

DO and PH measurements are now being taken at the sample collection sites and in accordance with approved electrode method 4500 OG 2001 and 4500 HB 2000, respectively.

The DO meter was not properly calibrated. The meter needs to be calibrated according to the manufacturer's instructions. A Hach pH/DO HQ40d instrument was used to analyze both the DO and pH samples. However, the operator was unfamiliar with how to properly calibrate the DO.

The instrument is now calibrated as per manufacturer's instructions, and operator has been better educated on proper usage of the instrument.

The temperature and barometric pressure should also be recorded on the daily sheets. These calibration readings should be compared with the values in the USGS DO table. Consider the USGS as the standard or theoretical value. The calibration DO value should be within 10% of the USGS value.

A barometer also containing a thermometer was purchased and installed in the Laboratory. The USGS DO table has been printed and placed in the lab. The barometric pressure, temperature, and USGS DO reading is now recorded on the daily pH/DO meter calibration sheet. The DO calibration value is then compared to the recorded USGS DO value to ensure it is within the 10% range.

According to Mr. Perkins, the DO membrane had recently been replaced. The membrane should be changed monthly and recorded either in a maintenance log or on the daily sheets.

The replaceable part of the probe is the probe cap. The manufacturer recommends replacing the cap annually or more often if it becomes damaged or fouled. The meter will show a reminder message when 30 days of probe service life remains on the probe cap. A maintenance

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log has been developed to record changing the probe cap. The probe is also stored in accordance with manufacturer's instructions.

4. The pH sample analysis was obtained using an HQ40d field meter. Calibration of the meter was observed and appeared to be appropriately conducted. The operator was advised to also record the sample temperature and document exactly what the buffer standards read. The operator was also advised to keep probe storage solution on hand to keep the probe clean.

The daily calibration bench sheet now reflects the temperature and the buffer standards measurements as well as all other required data. The pH probe is stored in Hach pH storage solution which is kept on hand for that purpose.

5. To ensure accurate sample measurements, it was recommended that the operators, after they calibrate the DO/pH probes using the HQ40d instrument, record DO and pH readings in the plant instead of bringing the samples back to the laboratory for analysis.

DO and pH measurements are now being taken in the field at the required sample sites as specified in our NPDES permit.

6. Daily sample work sheets were not properly recording the daily influent and effluent sampling information as required by the NPDES permit section 1.2.4. The daily work sheets need to record the information required in section 1.2.4. of the permit.

- a. The exact place, date and time of sampling
- b. The exact person(s) collecting samples
- c. The dates and times the analyses were performed
- d. The person(s) or laboratory who performed the analyses
- e. The analytical techniques or methods used, and
- f. The results of all required analyses.

All the required data is now recorded on the daily bench sheets for the influent and effluent sampling and analysis. Not only are these bench sheets stored in labeled daily influent and effluent binders, but copies are also placed in binders dedicated to each individual analyst to track analyses performed by the individual. Analysis results are also recorded in a laboratory ledger.

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7. Sampler strainers were observed to have accumulated debris on the strainers which could produce erroneous results. The strainers need to be cleaned daily.

Our influent screening system was found to be allowing more debris to pass through than it should have. We believe this was causing an unusual amount of debris to collect on the strainer of the influent sampler. The screen has worn to a point beyond adjustment. We have issued a PO and given a notice to proceed to a contractor who will rebuild our screening system. However, we are field cleaning the influent and effluent strainers daily. We have also ordered spare strainers to change out monthly with sampler tubing change to do a more thorough cleaning of the strainers on a monthly cycle.

8. The sampling technique used to collect the E. coli samples is suspected to be the cause of the spikes in some of the E. coli results. At the time of the inspection, the plant was using a container with a cord to pull the sample and transfer it to a sterilized container. The E. coli sample needs to be collected directly in the sterilized container provided by the laboratory. The plant's sampling technique needs to be revisited to ensure that the sample is representative and accurate.

Since the November PAI we have been collecting the sample as suggested using only the sterilized container provided by the laboratory. We have washed our hands with soap and water, then used hand sanitizer, put on latex gloves, and held only the sterilized container by the lower half without touching anything else. We check to be sure the seal is unbroken on the container, pull the cap off at the collection site while holding so debris cannot settle onto the container, and ensure gloved fingers do not touch the inside of it. We carefully collect the appropriate amount being sure not to touch anything with the container and then immediately place the cap back on the container. We had no E. coli spikes in November or December of 2016. So far for the month of January 2017 we have had 3 unexplained spikes. Our other effluent parameters have been good and our discharges are clear. We see no reason for the spikes, particularly when for days prior to and days after the spikes of greater than 2420, the results may be less than 1. We ensure our disinfection system is kept clean and the ultraviolet lights are working. We continue to investigate this issue consulting with Mr. Bouzeid, Mr. Brett Ward with MTAS and other local municipal STPs. We have also ordered sterile gloves to use for collecting E. coli samples. We are doing everything we can think of to eliminate the possibilities of any sample contamination on our part. It is our plan to collect duplicate samples to send to another laboratory to compare the results with the results of our current laboratory. This may give more insight as to where the problem lies.

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9. The settleable solids sample was not shaken prior to pouring it in the Imhoff cone. Thus, producing erroneous results.

The sample is now shaken prior to pouring it into the Imhoff cone. We have also changed the sampling technique to collect only the 1000 mL required to reflect a more representative sample.

10. The composite sampler tubing had just been replaced. Please be aware that the tubing should be replaced at least monthly and the frequency of replacement should be reflected in the standard operating procedures (SOP). A record should be kept of the tubing replacement and the amount of sample collected checked to ensure a minimum of 100mL is acquired.

It is noted on our daily check sheets to check condition of the tubing and replace monthly. It is also noted on a separate record kept to show the dates the tubing is changed and the person who changed the tubing. The individual sample amount collected is checked weekly. The samplers are programmed to collect 150 mL per sample to ensure that at least the 100 mL minimum is collected per sample.

11. The thermometers in the composite samplers were faulty and needed to be replaced. A daily temperature log was not kept.

New thermometers were installed in the influent and effluent composite samplers as well as the laboratory refrigerator. Temperatures are now recorded on daily check sheets.

12. The desiccant in the vacuum desiccator as well as the effluent composite sampler needed to be replaced or regenerated as required by the composite sampler manual.

The desiccant in the vacuum desiccator was regenerated in accordance with the manufacturer's instructions. The desiccant in the effluent sampler was replaced.

13. A barometer is needed in the lab room to assist in the necessary daily equipment calibration, mainly the DO meter.

A barometer has been installed in the laboratory.

14. The standard operating procedures (SOP) for sampling procedures; instructions on proper calibration of field equipment; Quality control (QC) procedures for equipment calibration; and QC procedures for lab analysis conducted at the plant needs to be updated. The SOP should include QC measures as directed in 40 CFR136.7 also called the method update rule (MUR). Ms. Loudermilk provided the MUR guidance documents to the operators by way of the Fleming Training Center website.

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SOP's for sampling procedures, equipment calibration, and analysis have been updated to reflect the latest QC measures as directed by 40 CFR136.7. We will continue to update SOP's and develop new ones as needed to ensure we meet the requirements of our NPDES permit. We have developed a main lab document containing all pertinent information. This document will be a living document which will be continually updated and added to. I have included the table of contents of this main lab document (see attachment B) to give you some insight into the steps we are taking to improve our laboratory QA/QC and documentation.

15. The Standard Method for the Examination of Water and Wastewater book could not be located. It was advised that the 22nd edition of this book would be required since it contained the currently EPA approved methods of analyses and the quality assurance and quality control measures for these methods of analysis.

The 22nd edition of the Standard Method for the Examination of Water and Wastewater book has been purchased. This book with all other laboratory documentation has been placed on one shelf in the laboratory for ease of access for all analysts.

Part B

On June 15, 2016, the Arlington STP received a Notice of Violation from Ms. Connie Raines, U.S. Environmental Protection Agency Region 4. In this NOV Ms. Raines requested explanations for numerous violations from January 1, 2016 to present. On June 26, 2016 I sent a detailed report to Ms. Raines outlining the issues which caused the exceedances during the specified period (see attachment C). Following the issuance of that report, on July 11, 2016, we had a plant upset. We noticed that the dissolved oxygen in our SBR basins dropped to zero and remained there. Immediately prior to this drop in DO we suspected that one of the industries had discharged an excessive amount of BOD which dramatically changed the color of our influent. We immediately collected a grab sample of the influent. Testing showed that we did have an excessive amount of BOD. We took effluent samples from the discharge of the suspected industry and had our 3rd party laboratory perform a "fingerprint" analysis to compare with the grab sample collected at the STP influent. The results were inconclusive. We increased aeration times to the basins to try to compensate for the low DO. On August 10, 2016 we met with Brett Ward, consultant with MTAS, to seek guidance on why our DO was dropping out. He suggested that it could be caused by quaternary ammonia which some food industries use for cleaning and sanitizing. We then promptly met with the food industry which we suspected could be causing the problem. We were unable to find specific evidence that they were discharging high levels of quaternary ammonia. We took samples from each of our 2 SBR basins and set a discrete sampler immediately downstream of the industry in question to collect samples around the clock. We

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also met with managers of other food establishments in the area. The quaternary ammonia results from our basin samples showed 29.6 mg/L for #1 basin and 44.7 mg/L for #2 basin. We learned that nitrification begins to be inhibited at 2 mg/L. The other sampler results and further investigation yielded no conclusive evidence of the source of the quaternary ammonia. However, we continued to monitor quaternary ammonia in our influent for a 30 day period with no other spikes. Our DO began to rebound and we had no further drops DO in the SBR basins.

From August 25, 2016 through the end of the year we only had 2 exceedances which were unexplained E.coli spikes in October. We are currently working diligently to find the cause of and eliminate these unexplained spikes in E. coli. As our effluent numbers have shown since late August of 2016, we have made strides toward improving many areas of our process to ensure we are in compliance with our NPDES permit. It is an ongoing process which we will continue to evaluate and improve upon. We greatly appreciate the partnership we have with the Tennessee Department of Water Resources. Your staff has been invaluable in assisting us in our efforts to be compliant. Please contact me anytime if needed by phone, 901-623-4686, or by email tperkins@townofarlington.org.

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Sincerely,

Terry Perkins
Wastewater Manager, Town of Arlington

Ec: Eddy Bouzeid, Environmental Protection Specialist, TDEC DWR
Barbara Loudermilk, Consultant, compliance and Enforcement Unit, DWR
Cathy Durant, Administrator, Town of Arlington
Bobby Kendall, Public Works Director, Town of Arlington